

ROBBINS GELLER RUDMAN
& DOWD LLP
SHAWN A. WILLIAMS (213113)
JOHN H. GEORGE (292332)
One Montgomery Street, Suite 1800
San Francisco, CA 94104
Telephone: 415/288-4545
415/288-4534 (fax)
shawnw@rgrdlaw.com
jgeorge@rgrdlaw.com
– and –
PAUL J. GELLER
(appearance *pro hac vice*)
STUART A. DAVIDSON
(appearance *pro hac vice*)
CHRISTOPHER C. GOLD
(appearance *pro hac vice*)
120 East Palmetto Park Road, Suite 500
Boca Raton, FL 33432
Telephone: 561/750-3000
561/750-3364 (fax)
pgeller@rgrdlaw.com
sdavidson@rgrdlaw.com
cgold@rgrdlaw.com

Attorneys for Plaintiffs
[Additional counsel appear on signature page.]

LABATON SUCHAROW LLP
LAWRENCE A. SUCHAROW
(appearance *pro hac vice*)
JOEL H. BERNSTEIN
(appearance *pro hac vice*)
MICHAEL P. CANTY
(appearance *pro hac vice*)
CORBAN S. RHODES
(appearance *pro hac vice*)
ROSS M. KAMHI
(appearance *pro hac vice*)
140 Broadway
New York, NY 10005
Telephone: 212/907-0700
212/818-0477 (fax)
lsucharow@labaton.com
jbernstein@labaton.com
mcanty@labaton.com
crhodes@labaton.com
rkamhi@labaton.com

EDELSON PC
JAY EDELSON
(appearance *pro hac vice*)
350 North LaSalle Street, Suite 1300
Chicago, IL 60654
Telephone: 312/589-6370
312/589-6378 (fax)
jedelson@edelson.com

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

In re FACEBOOK BIOMETRIC) Master File No. 3:15-cv-03747-JD
INFORMATION PRIVACY LITIGATION)
) PLAINTIFFS' OPPOSITION TO
) FACEBOOK'S MOTION TO EXCLUDE
This Document Relates To:) PORTIONS OF THE EXPERT REPORT,
) OPINIONS AND TESTIMONY OF DR.
ALL ACTIONS.) ATIF HASHMI
)
) Date: May 3, 2018
Time: 10:00 a.m.
Location: Courtroom 11

Hon. James Donato

[REDACTED]

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1 Plaintiffs Adam Pezen, Nimesh Patel, and Carlo Licata (“Plaintiffs”) respectfully submit
 2 this memorandum of points and authorities in opposition to Defendant Facebook, Inc.’s
 3 (“Facebook” or “Defendant”) Motion to Exclude Portions of the Expert Report, Opinions and
 4 Testimony of Dr. Atif Hashmi. ECF No. 303 (“Motion” or “Mot.”).

5 INTRODUCTION

6 Dr. Atif Hashmi (“Dr. Hashmi”) is a computer scientist who is eminently qualified to
 7 provide opinions on Facebook’s facial recognition software and architecture based on his many
 8 years of academic and professional experience working with deep neural networks (“DNNs”)
 9 and machine learning methods of object classification materially the same as those that Facebook
 10 uses to identify individuals in photos uploaded to its platform. While the methods that Facebook
 11 uses to perform facial recognition are indeed advanced and highly technical from a layperson’s
 12 point of view, they are by no means novel or unknown to the machine learning research
 13 community, of which Dr. Hashmi has been a part for more than a decade.

14 None of Dr. Hashmi’s opinions would be the least bit controversial in an academic
 15 setting. But since Facebook’s litigation strategy is to contort the facts surrounding its facial
 16 recognition system in order to avoid the reach of BIPA’s privacy protections, Facebook is forced
 17 to challenge certain basic facts that would otherwise be beyond any reasonable dispute –
 18 because, in fact, they are. Facebook does not challenge the vast majority of Dr. Hashmi’s
 19 opinions. Rather, Facebook challenges only two of the opinions in Dr. Hashmi’s report.¹

20 ***First***, Facebook challenges Dr. Hashmi’s opinion that its facial-recognition algorithms
 21 “extract, learn, and rely upon facial landmarks or features” to generate face signatures. Mot. at
 22 1. Again, under normal circumstances this would be an entirely uncontroversial opinion that is
 23 overwhelmingly supported by Facebook’s source code, public reports, internal documents, and a
 24 wealth of academic literature about the methodologies Facebook employs, which are proprietary,
 25 but by no means novel. It is actually the converse proposition Facebook offers that is highly

26
 27 ¹ Expert Report of Dr. Atif Hashmi, dated December 22, 2017, attached as Exhibit 1 to the
 28 Declaration of John Nadolenco (“Nadolenco Decl.”) (“Hashmi Report”). All emphases herein are added
 unless otherwise noted.

1 suspect: that its technology purportedly performs facial recognition *without* relying on “facial
 2 landmarks or features.” This creative position can only be achieved by accepting Facebook’s
 3 absurd argument that the DNN Facebook built is so advanced that its operation is beyond the
 4 limits of human understanding, [REDACTED]
 5 [REDACTED].² That is nonsense. While the technology is
 6 complex, it is simply not true that the academic, research and professional communities that have
 7 studied, developed, and used these methods for years do not comprehend how they work.
 8 Unsurprisingly, that research—*and Facebook’s own documents describing their DNN in their*
 9 *own words*—shows that facial recognition DNNs analyze and compare faces by extracting,
 10 learning, and relying upon facial landmarks and features. Plaintiffs are entitled to present these
 11 basic facts to the jury so they are not confused by Facebook’s tactical obfuscation.

12 *Second*, Facebook challenges Dr. Hashmi’s opinion that its “facial-recognition
 13 algorithms can generate face signatures for virtually every face that is present in a photo
 14 uploaded to Facebook’s system,” including that of non-users. Mot. at 1. Not only is this opinion
 15 quite narrow, [REDACTED]

16 [REDACTED]
 17 [REDACTED]
 18 [REDACTED]
 19 [REDACTED]
 20 [REDACTED]
 21 [REDACTED] But in any event, even if Dr. Hashmi’s position were as Facebook
 22 portrays, any such disputes are now moot in light of the Court’s decisions on class certification
 23 as to the users, and summary judgment as to the non-users.

24 Finally, none of Facebook’s perfunctory attacks on Dr. Hashmi’s experience raise any
 25 serious doubts about his qualifications to offer the narrow opinions in his report about how

26 _____
 27 ² [REDACTED]
 28 [REDACTED]

Facebook's facial recognition system works. Unlike Facebook's purported expert, Dr. Hashmi was not tasked with performing any statutory analysis or providing opinions about whether Facebook's conduct falls within the meaning of BIPA, but rather, limited his expert opinion to the explanation of how Facebook's system operates – namely, describing the data that the system gathers, the functions it performs on the data it collects, the output of those functions, and how and where Facebook stores the data it collects. Dr. Hashmi has all of the necessary qualifications to perform this analysis and arrive at the conclusions he presents.

BACKGROUND

A. Summary of Dr. Hashmi's Qualifications

Dr. Hashmi holds an M.S. and a Ph.D. in Electrical Engineering from the University of Wisconsin, with a focus on implementing traditional artificial intelligence algorithms, including DNNs, as well as modeling biological-inspired neural networks in both software and in hardware. He has authored peer-reviewed papers and articles related to neural networks and artificial intelligence, several of which have received best paper awards at academic and industry conferences. Immediately after completing his Ph.D., Dr. Hashmi was selected to collaborate with IBM on the DARPA Systems of Neuromorphic Adaptive Plastic Scalable Electronics ("SyNAPSE") project, with an aim to develop neural network hardware and software that matches the capabilities, size, and power consumption of a mammalian brain.³

In his professional career, Dr. Hashmi co-founded Thalchemy Corporation, which developed and commercialized neural network software technology for the smartphone and wearable device market. Thalchemy Corporation has been awarded multiple grants by the National Science Foundation ("NSF") to perform cutting-edge research in the fields of neural network system. Dr. Hashmi was assigned as Principle Investigator to conduct and administer research for two of these NSF awards. Dr. Hashmi has personally developed neural network software products and is a named inventor on multiple patents and patent applications for neural network software and hardware for processing sensory data. Recently, Dr. Hashmi was

³ See <https://www.darpa.mil/program/systems-of-neuromorphic-adaptive-plastic-scalable-electronics>

1 nominated by NSF as an expert advisor to review funding proposals submitted to NSF related to
 2 the fields of sensor networks and machine learning and to advise NSF on the technical merit and
 3 quality of the submitted proposals.⁴ Dr. Hashmi has performed technical forensic analysis work
 4 in several cases involving software copyright infringement, trade secret theft, source code
 5 quality, and patent infringement litigations. He has also given expert testimony and submitted
 6 expert reports in which he offered opinions regarding his technical analysis.

7 **B. Overview of Dr. Hashmi's Opinions**

8 Dr. Hashmi's Report explains how Facebook's facial recognition software operates,
 9 based on Facebook's source code, internal and public Facebook documents, and testimony of
 10 Facebook witnesses. Dr. Hashmi arrives at four opinions concerning Facebook's system that are
 11 relevant to this case, of which, only the first two are challenged by Facebook:

- 12 • Facebook's face classification algorithms extract, learn, and rely upon facial
 13 landmarks or features including human eyes, nose, chin, and mouth to generate
 the representative face signatures.
- 14 • Facebook's face classification algorithms can generate a representative face
 15 signature for virtually every face that is present in a photo uploaded to Facebook's
 system, including the faces of non-users.

- 16 • [REDACTED]
- 17 [REDACTED]
- 18 [REDACTED]
- 19 [REDACTED]

20 Dr. Hashmi arrived at these conclusions after extensive review of Facebook's source
 21 code and other documents produced by Facebook concerning their facial recognition algorithms,
 22 as well as testimony of Facebook witnesses. Dr. Hashmi's opinions are also informed by
 23 publications regarding the techniques and methodologies that make up Facebook's facial
 24

25
 26
 27 ⁴ See Dr. Hashmi's updated C.V., attached as Exhibit 1 to the Declaration of Corban S. Rhodes in
 28 Opposition to Facebook's Motion to Exclude Dr. Hashmi, exhibits to which are referred to herein by "Ex.
 —".

recognition process that have been studied extensively in academic and industry literature, including by Dr. Hashmi who has worked with those methods for more than a decade.

ARGUMENT

I. Dr. Hashmi's Expert Opinions are Well-Founded and Supported

"To be admissible, expert testimony must (1) address an issue beyond the common knowledge of the average layman, (2) be presented by a witness having sufficient expertise, and (3) assert a reasonable opinion given the state of the pertinent art or scientific knowledge." *United States v. Vallejo*, 237 F.3d 1008, 1019 (9th Cir. 2001), opinion amended on denial of reh'g, 246 F.3d 1150 (9th Cir. 2001) (citation omitted); *see also Jinro Am. Inc. v. Secure Invs., Inc.*, 266 F.3d 993, 1004 (9th Cir. 2001) ("Rule 702 is applied consistent with the 'liberal thrust' of the Federal Rules and their general approach of relaxing the traditional barriers to opinion testimony.") (citation omitted).

Facebook does not dispute that Dr. Hashmi's opinions address issues that are beyond the common knowledge of the average layman. Instead, Facebook attacks the evidence that Dr. Hashmi relies on to support his opinions as well as Dr. Hashmi's experience and expertise in certain sub-specialties. None of these critiques call into question the reliability of Dr. Hashmi's opinions.

A. Dr. Hashmi's opinion that Facebook's facial-recognition algorithms "extract, learn, and rely upon facial landmarks or features" to generate face signatures is reliable

Facebook's attack on Dr. Hashmi's opinion that Facebook's algorithms "extract, learn, and rely upon facial landmarks or features" relies heavily on a mischaracterization and distortion of a single snippet of Dr. Hashmi's testimony. Specifically, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1 [REDACTED]
2 [REDACTED]
3 [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
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18 [REDACTED]
19 [REDACTED]
20 [REDACTED]
21 [REDACTED]
22 [REDACTED]
23 [REDACTED]
24 [REDACTED]

25 ⁶ See Zeiler, et al., Visualizing and Understanding Convolutional Networks, Springer, 2014 (“Zeiler
26 Paper”) (Ex. 3) at 824 (“...exaggeration of discriminative parts of the image, e.g. eyes and noses of dogs
27 (layer 4, row 1, cols 1)”; see also Kamencay, et al., A New Method for Face Recognition Using
Convolutional Neural Network, 2017 (“Kamencay”) (Ex. 4) at 668 (“Second layer detects features from
previous layers, thus it is able to detect more complex shapes like eye, nose or mouth.”).

28 ⁷ [REDACTED]

1. **Identify the subject and the verb in the sentence.**
 2. **Identify the object of the verb.**
 3. **Identify the subject complement.**
 4. **Identify the object complement.**
 5. **Identify the modifier.**
 6. **Identify the adverb.**
 7. **Identify the adjective.**
 8. **Identify the preposition.**
 9. **Identify the conjunction.**
 10. **Identify the interjection.**

⁹ See Zeiler Paper (Ex. 3) at 818 (“We introduce a novel visualization technique that gives insight into the function of intermediate feature layers and the operation of the classifier.”); *see also* Kamencay (Ex. 4) at 663 (“Facial features are extracted and implemented through algorithms, which are efficient and some modifications are done to improve the existing algorithm models.”); *see also* Saxe, et al., Learning

Facebook's claim that Dr. Hashmi's opinions are not supported by peer-reviewed research is baseless. Mot. at 10.

Facebook singles out one of the publications Dr. Hashmi cited, namely a 2009 paper authored by researchers at Stanford ("2009 Stanford Paper"), which clearly depicts that a DNN

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

In short, Facebook simply chooses to ignore the abundance of evidence, explicit both within its own documents and source code and academic research, that plainly supports Dr. Hashmi's opinions. Whereas Facebook hopes to simply tell the jury that its facial recognition

(continued . . .)

hierarchical category structure in deep neural networks, CogSci, 2013 (Ex. 6) at 1271 ("This pattern of progressive differentiation has also been seen in neural network models as they learn from exposure to training data. Our work explains *why* the networks exhibit these phenomena."); *see also* Lee, at al., Convolutional Deep Belief Networks for Scalable Unsupervised Learning of Hierarchical Representations, International Conference on Machine Learning, 2009 (Ex. 7) at 1 ("Deep architectures consist of feature detector units arranged in layers. Lower layers detect simple features and feed into higher layers, which in turn detect more complex features.").

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

debate has been mooted by the Court's ruling on class certification.¹³

In any event, this argument appears moot in light of the Court's Summary Judgment decision dismissing the non-user case.¹⁴

II. Dr. Hashmi is Manifestly Qualified to Testify to the Opinions in his Report

Dr. Hashmi has more than a decade of experience with DNNs and other machine learning techniques like those used by Facebook, both in an academic and professional capacity. His Ph.D. work focused on brain-inspired computing and both hardware and software modeling of neural systems, particularly the neural systems that perform visual object recognition. During his Ph.D., Dr. Hashmi studied and developed various types of DNN and trained these neural networks to perform visual object recognition. Dr. Hashmi has published several peer-reviewed publications in the area of neural network and machine learning. Dr. Hashmi co-founded a company that developed and commercialized neural network software technology for the smartphones and wearable devices market, and which has been awarded multiple grants by the NSF to perform cutting-edge research in the fields of neural network system. He has extensive

¹³ See Order re Class Certification, Dkt. 333 (April 16, 2018).

¹⁴ *Gullen v. Facebook*, 16-cv-00937-JD, Order re Summary Judgment, Dkt. 106 (April 3, 2018).

1 experience as a forensic software expert performing source code analysis in other litigation as he
 2 has done here. Facebook's perfunctory attacks on Dr. Hashmi's qualifications are unavailing.

3 Facebook primarily argues that Dr. Hashmi lacks sufficient experience working with
 4 DNNs that specifically recognize faces as opposed to other visual objects. Mot. at 12-15. To be
 5 clear, Dr. Hashmi has extensive experience with DNNs, which can be trained to perform visual
 6 object classification, including facial recognition. To the extent his past work has focused on
 7 DNNs that perform object classification generally, that experience is highly relevant. A face is
 8 an object. A DNN used to classify human faces is the same as a DNN that is used to classify any
 9 other type of object—the only material difference being the content of the images that are used to
 10 train the DNN.¹⁵ Therefore, this is a distinction without a difference as it pertains to Dr.
 11 Hashmi's ability to explain the functionality of Facebook's DNN. **At most**, Facebook's
 12 arguments that Dr. Hashmi does not have sufficient expertise with a particular application of
 13 DNNs goes to the weight of his testimony, not its admissibility. *See United States v. Garcia*, 7
 14 F.3d 885, 889–90 (9th Cir. 1993) (holding that “lack of particularized expertise goes to the
 15 weight accorded [expert's] testimony, not to the admissibility”); *Clemons v. Burlington Northern*
 16 *Santa Fe Railway*, 15 Civ. 1733 (SJO), 2016 WL 9752053, at *12 (C.D. Cal. May 3, 2016)
 17 (“Indeed, ‘the fact that the [expert] is not a specialist in the field in which he is giving his opinion
 18 affects not the admissibility of his opinion but the weight the jury may place on it.’”) (collecting
 19 cases).¹⁶

20
 21 ¹⁵ See, e.g., Zeiler Paper (Ex. 3) at Fig. 2 (showing examples of the same DNN being trained on
 different objects).

22 ¹⁶ See also *Gardner v. Astrue*, 11 Civ. 9616 (JEM), 2012 WL 4052047, *3 (C.D. Cal. Sept. 14, 2012)
 23 (“Plaintiff alleges physical impairments that Dr. Vu certainly is qualified to assess and Plaintiff does not
 24 contend otherwise. Dr. Vu testified to considerable experience with lupus and limited experience with
 25 Sjogren's syndrome. Plaintiff's position would require the ALJ to call a separate specialist in every
 26 impairment area. Plaintiff cites no authority for such a requirement. Plaintiff's objection goes to weight,
 27 not admissibility.”); *Corcoran v. CVS Health*, 15 Civ. 3504 (YGR), 2017 WL 1065135, at *11 (N.D. Cal.
 28 Mar. 21, 2017) (finding that expert had necessary “foundational background upon which to draw
 conclusions from relevant data and documents,” and fact that expert did “not have specific experience
 applying health membership program prices to U&C provisions relates to weight, not admissibility.”);
Ashland Oil, Inc. v. Delta Oil Prods. Corp., 685 F.2d 175, 178 (7th Cir. 1982) (upholding admission of
 expert's opinion despite his lack of specialization in a particular branch of chemistry); 1 McCormick On
 Evid. § 13 (7th ed. 2016) (“While the court may rule that a certain subject of inquiry requires that a

1 Facebook next attempts to demonstrate that Dr. Hashmi lacks the requisite bona fides by
 2 quoting out of context snippets of his deposition testimony in an attempt to score cheap points.

3 [REDACTED]

4 [REDACTED]

5 [REDACTED]

6 [REDACTED]

7 [REDACTED]

8 [REDACTED]

9 [REDACTED] Neither of these attempts come close to establishing or even suggesting that Dr.
 10 Hashmi lacks the requisite expertise to render his opinions in this case.

11 Facebook is similarly vague with respect to why it claims Dr. Hashmi's opinions
 12 concerning [REDACTED]

13 [REDACTED]

14 [REDACTED]

15 [REDACTED]

16 [REDACTED]

17 [REDACTED] As described in Dr. Hashmi's CV (and not
 18 challenged by Facebook), Dr. Hashmi has significant experience with the relevant coding
 19 languages and with the forensic software analysis necessary to assess such code.

20 Finally, it is worth noting that, as discussed above, Dr. Hashmi was tasked with
 21 providing, and provided, only narrow and straightforward opinions concerning the functionality
 22 of Facebook's facial recognition system based on his review of the source code and other
 23 Facebook documents, most of which is unchallenged. Facebook attempts to distort these basic
 24 operational realities with [REDACTED]

25 [REDACTED]

26 _____
 27 (*continued . . .*)

28 member of a given profession ... be called; usually a specialist in a particular branch within a profession
 will not be required." (footnote omitted)).

1 [REDACTED] about which Dr. Hashmi does not opine. Ultimately, these labels do not carry the
2 weight that Facebook places on them, but that issue is addressed by Plaintiffs' rebuttal expert,
3 Jeffrey Dunn. Dr. Hashmi's report is complimented and corroborated by the report of Mr. Dunn,
4 whose expertise with respect to facial recognition systems Facebook does not challenge.

5 **CONCLUSION**

6 For the reasons stated above, the court should deny Facebook's Motion to Exclude
7 Portions of the Expert Report, Opinions and Testimony of Dr. Atif Hashmi.

8
9 DATED: April 16, 2018

Respectfully submitted,

10 LABATON SUCHAROW LLP

11 /s/ Michael P. Canty

LAWRENCE A. SUCHAROW*

12 JOEL H. BERNSTEIN*

MICHAEL P. CANTY*

13 CORBAN S. RHODES*

ROSS M. KAMHI*

14 140 Broadway

15 New York, NY 10005

Telephone: 212/907-0700

16 212/818-0477 (fax)

17 ROBBINS GELLER RUDMAN
& DOWD LLP

18 SHAWN A. WILLIAMS (213113)

JOHN H. GEORGE (292332)

19 One Montgomery Street, Suite 1800

San Francisco, CA 94104

20 Telephone: 415/288-4545

415/288-4534 (fax)

21 ROBBINS GELLER RUDMAN
& DOWD LLP

22 PAUL J. GELLER*

23 STUART A. DAVIDSON*

CHRISTOPHER C. GOLD*

24 120 East Palmetto Park Road, Suite 500

Boca Raton, FL 33432

25 Telephone: 561/750-3000

26 561/750-3364 (fax)

1
2
3
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9
10
11
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13
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EDELSON PC
JAY EDELSON*
RAFEY S. BALABANIAN*
350 North LaSalle Street, Suite 1300
Chicago, IL 60654
Telephone: 312/589-6370
312/589-6378 (fax)
Attorneys for Plaintiffs
* = appearance *pro hac vice*

CERTIFICATE OF SERVICE

I hereby certify that on March 16, 2018, I authorized the electronic filing of the foregoing with the Clerk of the Court using the CM/ECF system which will send notification of such filing to the e-mail addresses denoted on the attached Electronic Mail Notice List, and I hereby certify that I caused to be mailed the foregoing document or paper via the United States Postal Service to the non- CM/ECF participants indicated on the attached Manual Notice List.

I certify under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed on March 16, 2018.

/s/ Michael P. Canty
MICHAEL P. CANTY (*pro hac vice*)
LABATON SUCHAROW LLP
140 Broadway
New York, NY 10005
Telephone: 212/907-0700
212/818-0477 (fax)
mcanty@labaton.com

Mailing Information for a Case 3:15-cv-03747-JD In re Facebook Biometric Information Privacy Litigation**Electronic Mail Notice List**

The following are those who are currently on the list to receive e-mail notices for this case.

- **Rafey Sarkis Balabanian**
rbalabanian@edelson.com,docket@edelson.com
- **James E Barz**
jbarz@rgrdlaw.com
- **Joel H. Bernstein**
jbernstein@labaton.com,JGardner@labaton.com,kgutierrez@labaton.com,cvillegas@labaton.com,RKamhi@labaton.com,1375722420@filings.docketbird.com,electroniccasefiling@labaton.com,sauer@labaton.com
- **Michael P. Canty**
mcanty@labaton.com,7677707420@filings.docketbird.com,lmehringer@labaton.com,fmalonzo@labaton.com,acarpio@labaton.com,electroniccasefiling@labaton.com
- **Albert Y. Chang**
achang@bottinilaw.com,sammirati@bottinilaw.com
- **Vincent Connelly**
vconnelly@mayerbrown.com
- **Stuart Andrew Davidson**
sdavidson@rgrdlaw.com,5147990420@filings.docketbird.com,jdennis@rgrdlaw.com,e_file_sd@rgrdlaw.com,e_file_fl@rgrdlaw.com
- **Mark Dearman**
mdearman@rgrdlaw.com,9825585420@filings.docketbird.com,e_file_sd@rgrdlaw.com,e_file_fl@rgrdlaw.com
- **Mark J. Dearman**
mdearman@rgrdlaw.com
- **Jay Edelson**
jedelson@edelson.com,docket@edelson.com
- **Amanda M. Frame**
aframe@rgrdlaw.com
- **Paul J. Geller**
pgeller@rgrdlaw.com,swinkles@rgrdlaw.com,e_file_fl@rgrdlaw.com
- **Paul Jeffrey Geller**
pgeller@rgrdlaw.com
- **John Hamilton George**
jgeorge@rgrdlaw.com
- **Christopher Chagas Gold**
cgold@rgrdlaw.com,4703056420@filings.docketbird.com,jdennis@rgrdlaw.com,e_file_sd@rgrdlaw.com,e_file_fl@rgrdlaw.com
- **Lauren R Goldman**
lrgoldman@mayerbrown.com,mrayfield@mayerbrown.com,jmarsala@mayerbrown.com
- **Frank S Hedin**
fhedin@hedinhall.com
- **Lily E. Hough**
lough@edelson.com,docket@edelson.com
- **Ross M Kamhi**
rkamhi@labaton.com,kgutierrez@labaton.com,electroniccasefiling@labaton.com
- **David Philip Milian**
DMilian@CareyRodriguez.com,ejimenez@careyrodriquez.com,ecf@careyrodriquez.com
- **John Nadolenco**
jnadolenco@mayerbrown.com,rjohns@mayerbrown.com,los-docket@mayerbrown.com,jaustgen@mayerbrown.com,tstruwe@mayerbrown.com,gtmiller@mayerbrown.com,cgarcia@mayerbrown.com,jjennings@mayerbrown.com,jlee8@mayerbrown.com
- **Alexander Nguyen**
anguyen@edelson.com,docket@edelson.com
- **Archis A. Parasharami**
aparasharami@mayerbrown.com
- **Archis Ashok Parasharami**
aparasharami@mayerbrown.com,4085092420@filings.docketbird.com,wdc.docket@mayerbrown.com
- **Matthew David Provance**
mprovance@mayerbrown.com,courtnotification@mayerbrown.com
- **Michael E Rayfield**
mrayfield@mayerbrown.com
- **Corban S Rhodes**
crhodes@labaton.com,kgutierrez@labaton.com,3936743420@filings.docketbird.com,sauer@labaton.com,electroniccasefiling@labaton.com
- **Benjamin Harris Richman**
brichman@edelson.com,docket@edelson.com
- **Frank Anthony Richter**
frichter@rgrdlaw.com
- **Lawrence A. Sucharow**
lsucharow@labaton.com,kgutierrez@labaton.com,electroniccasefiling@labaton.com
- **Alexander Glenn Tievsky**
atievsky@edelson.com,docket@edelson.com

- **Shawn A. Williams**

shawnw@rgrdlaw.com,smorris@rgrdlaw.com,ptiffith@rgrdlaw.com,dhall@rgrdlaw.com,e_file_sd@rgrdlaw.com,nlai@rgrdlaw.com

- **Mark R Winston**

mwinston@labaton.com,kgutierrez@labaton.com,electroniccasefiling@labaton.com

Manual Notice List

The following is the list of attorneys who are **not** on the list to receive e-mail notices for this case (who therefore require manual noticing). You may wish to use your mouse to select and copy this list into your word processing program in order to create notices or labels for these recipients.

Vincent **J. Connelly**

Mayer Brown LLP
71 South Wacker Drive
Chicago, IL 60606

Facebook Inc.

Cooley LLP
3000 El Camino Real
Five Palo Alto Square
Palo Alto, CA 94306-2155